CLEAN SITES INC

1199 NORTH FAIRFAX STREET / ALEXANDRIA VIRGINIA 22314 / 703-683-8522
TELECOPIER NO. 703-548-6773
MIDWEST REGIONAL OFFICE 1400 E TOUHY AVENUE / SUITE 215 / DES PLAINES, IL 60018 / 312-635-7580

MEMORANDUM

TO: Addressees

FROM: Douglas Ammon DGA

DATE: June 6, 1988

SUBJECT: Maryland Sand, Gravel and Stone Site

Dr. Paul Krueger requested that the following attached items be sent to you:

Agenda for the June 10, 1988 Site Visit

Workplan for Additional Bedrock Wells at the Maryland Sand, Gravel & Stone Site, Version 1.0, June 6, 1988

Please note that we plan to convene at the Knight's Inn Conference Room between 9:30 and 10:00 am on Friday, June 10 and promptly start the meeting at 10:00 am. The Knight's Inn is at Exit 109 on I-95, near Elkton.

Attachments

Addressees:

Dr. Paul Krueger, BOC (3 copies)
Sharon Feldstein, EPA-Region III (2 copies)
David Healy, MD Dept. of the Environment (2 copies)
John Kittridge, Dames & Moore
Bill Adams, Dames & Moore
George Murray, CSI
Jim O'Brien, CSI
Dr. James Tracy, Ground-Water Consultant (CSI)

302273

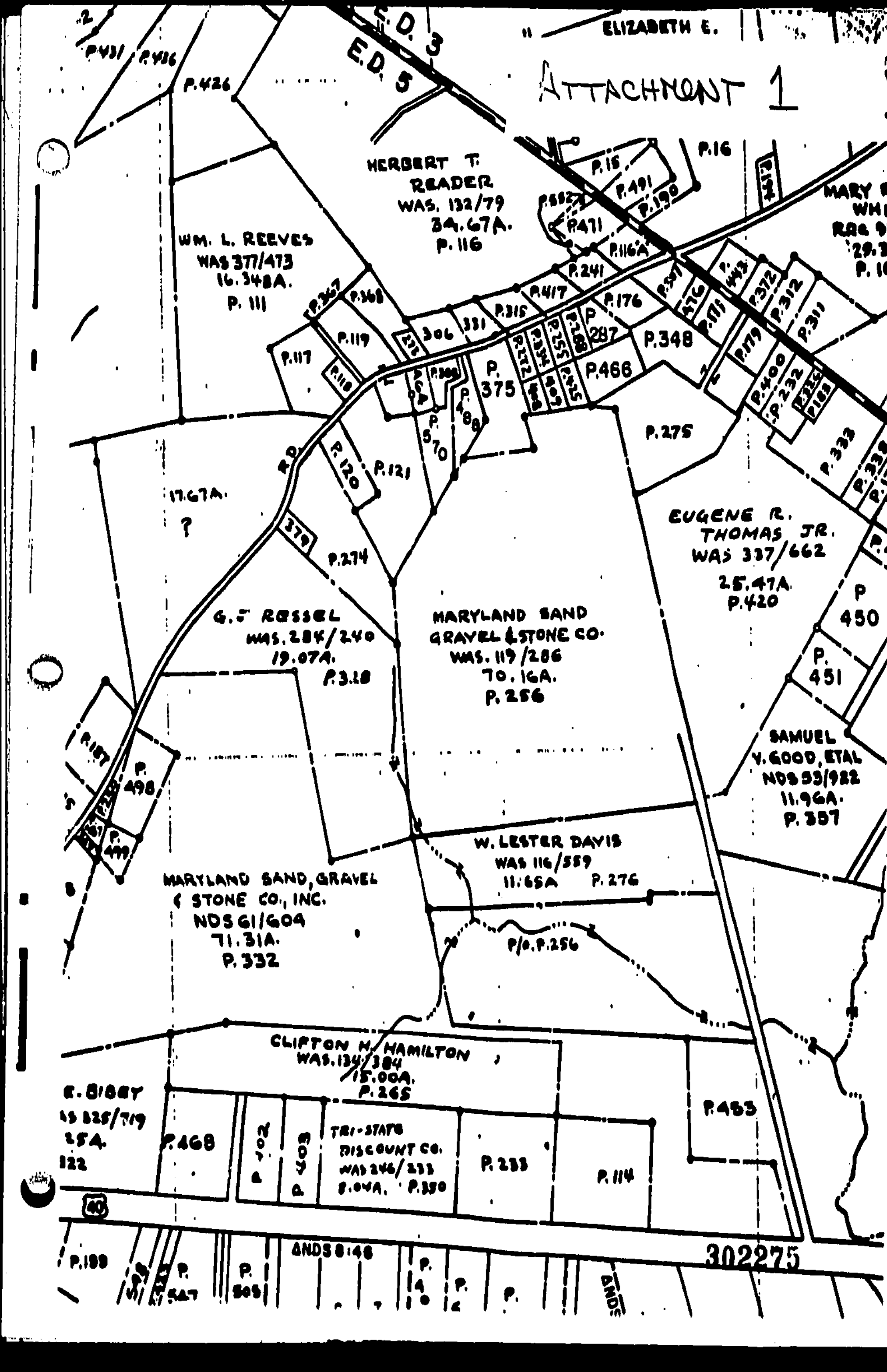
AGENDA
MSGS SITE VISIT
June 10, 1988

Meeting Facility:
Knight's Inn
I-95 Exit 109
Elkton, MD

Site Location:
MSGS Site
Ephrata Lane
South of Elkton, MD
Along US 40

9:30 - 10:00 am	Convene at Meeting Facility - Knight's Inn
10:00 - 12:00	Meeting - Knight's Inn
	o Review Site Maps
	o Review Monitoring Well Workplan
	o Examine Bedrock Cores
	o Review Fence Locations
	o Other Issues
	o Directions to the Site
12:00 - 1:00 pm	Lunch and Travel to the Site
1:00 - 3:30 pm	Site Visit
	o Tour Site
	o Locate Fence
	o Locate New Wells
3:30 - 5:00 pm	Return to Meeting Facility (if needed)

302274



ATTACHMENT 1
E.D. 3
E.D. 5
ELIZABETH E.
HERBERT T. READER
WAS. 132/79
34.67A.
P. 116
WM. L. REEVES
WAS 377/473
16.348A.
P. 111
MARY R
17.67A.
?
G. J. RESSEL
WAS. 284/240
19.07A.
P.318
MARYLAND SAND GRAVEL & STONE CO.
WAS. 119/286
70.16A.
P. 256
EUGENE R. THOMAS JR.
WAS 337/662
25.47A
P.420
SAMUEL V. GOOD, ETAL
NDS 53/922
11.96A.
P. 357
W. LESTER DAVIS
WAS 116/559
11.65A
P. 276
MARYLAND SAND, GRAVEL & STONE CO., INC.
NDS 61/604
71.31A.
P. 332
P/O.P.256
CLIFTON H. HAMILTON
WAS. 134/384
15.00A.
P. 265
TRI-STATE DISCOUNT CO.
WAS 246/233
5.04A.
P.350
P.468
P. 233
P. 114
P.453
P. 426
P. 16
P. 15
P. 491
P. 471
P. 116A
P. 241
P. 417
P. 176
P. 348
P. 466
P. 275
P. 287
P. 375
P. 315
P. 119
P. 117
P. 118
P. 120
P. 121
P. 274
P. 498
P. 499
P. 450
P. 451
P. 333
P. 400
P. 232
P. 372
P. 312
P. 311
306
331
379
40
ANDS 8:46
P. 505
P.547
P. 199
302275

WORKPLAN

ADDITIONAL BEDROCK WELLS AT MARYLAND SAND, GRAVEL & STONE SITE

VERSION 1.0 JUNE 6, 1988

INTRODUCTION

This workplan covers two additional bedrock wells and associated activities at the Maryland Sand, Gravel & Stone Site that EPA has requested as a supplement to the Phase II Remedial Investigation/Feasibility Study. The objective of the additional bedrock wells is to further characterize the bedrock unit at the site. The wells will be located and constructed in a manner that maximizes the probability of obtaining relatively productive yields (>10 gpm) though past characterization (on-site and regional studies) indicates that this probability is small.

Where applicable, the following approved plans and procedures will be used to conduct the additional activities:

"Quality Assurance Plan for Deep Soil and Bedrock Borings, Well Installation, and Aquifer Testing," Dames & Moore, August 22, 1986.

"Quality Assurance Plan for Surface Water, Sediment, and Groundwater Investigations," Dames & Moore, August 22, 1986.

"Standard Operating Procedures - Field Operations," Dames & Moore, August 22, 1986.

"Project Health and Safety Plan," Dames & Moore, November, 1985.

WELL LOCATION

The locations for two deep bedrock wells have been determined to better define the nature of the bedrock. The criteria used to locate these wells are: 1) locations that would be favorable for high yield in the bedrock, based on geologic structure and/or site hydrology; and 2) locations in the south area of the site that appear to be down gradient of the disposal areas. Existing site data, air photos, and available reports were reviewed to evaluate general and specific locations for the wells in consideration of these criteria.

Historical air photos for the period of 1969 through 1976 were obtained for the site. These air photos came from several sources and varied in scale from 1 to 24,000 to 1 to 60,000. Stereo-pairs of photos were analyzed to evaluate surficial expression of structure. No major structural features were noted. Quite a few minor features were identified in the region about the site. The orientation of these features were generally NE-SW and NW-SE. The existence of these surficial features in the present sediments does not imply that they are present in the underlying bedrock at depths greater than 100 feet. The deep bedrock boring logs of the existing site wells indicate variable depths of weathering and elevations of the bedrock surface; but the logs do not indicate any significant structural features in the bedrock. Therefore, no specific locations on the site would definitely meet the requirements of the first criterion. However, locations along the surface drainage pattern in the south and southeastern portion of the site are considered most probable to address this criterion. One well will be located in this drainage pattern.

Site well logs, offsite well data and water use data were reviewed to evaluate the general nature of the bedrock and overlying Potomac formations [Ref. 1, 2, and 3]. Approximately 27 water wells from the Maryland Geological Survey report are within about a one mile radius of the site or are on the site (Ref 2.). 22 of these wells are completed in the Potomac at depths of 22 to 181 feet. These wells yield from 3 to 60 gallons per minute with typical well yields of 20-30 gpm. Reported specific capacities for these wells vary from 0.5 to 3.8 gpm per foot. A majority of the specific capacities vary from 0.5 to 1.0 gpm per foot. Most of these wells have 5 to 10 feet of well screen. The five deep, bedrock wells are completed in the lower James Run formation at depths of 210 to 575 feet. These wells yield 0.5 to 5 gallons per minute, with typical well yields of 1 to 3 gallons per minute. Reported specific capacities for these wells are <0.1 gpm per foot. These wells are generally cased to the bedrock and are completed as open holes in the bedrock. The open-hole bedrock intervals vary from about 100 to 475 feet and are the functional equivalent of the screened intervals in the Potomac wells.

Based upon the onsite and offsite well data, water use and apparent direction of ground-water flow in the bedrock, the proposed locations (see Figure 1) for the two new bedrock wells are:

1) in the surface drainage area between wells D&M-07 and D&M-12 and

2) in the vicinity of SMW-10.

The first location is in a NW-SE orientation with D&M-07 (the highest yield on-site bedrock well), near the southern perimeter of the site, and directly south of the disposal area. The second location is southwest of the waste disposal area approximately perpendicular to the bedrock potentiometric contours on a path from the Sedge Meadow seep area. The second location also provides another point to determine vertical gradient between the lower sand and bedrock units since it can be paired with SMW-10; confirms the absence of a clay & silt layer that was not logged in the SWM-10 boring; and provides a good control point for contouring the bedrock potentiometric surface.

These locations will be used with other site wells to better define the bedrock and overlying formations. The data from the wells in these locations can be used with SMW-10, the D&M-02, 03, 05 & 06 cluster, the DMW-03 and D&M-07 cluster, and the DMW-02 and D&M-12 cluster data to evaluate the bedrock formation.

WELL DRILLING AND CONSTRUCTION

The target yield for the bedrock monitoring wells is 10 gpm or greater. If the target yield is not achieved, then the borehole will be completed to a maximum of 150 ft. into bedrock. Bedrock along the southern perimeter of the site is encountered between 100 to 160 feet below ground surface; thus, the bedrock monitoring wells have the potential to be 310-feet depth.

The monitoring wells will be drilled using mud rotary equipment to bedrock and air rotary equipment in bedrock. Downhole hammer equipment will not be used with the air rotary equipment to avoid possible contamination associated with this equipment. A 10-inch conductor casing (black-iron, Schedule 40 pipe) will be set and sealed from the ground surface to the first clay layer and grouted in-place in a 14-inch hole. After grout has set, drilling will then continue to approximately 5-feet into competent bedrock. 6-inch casing (new carbon steel Type IV welded water-well casing, ASTM A 589-84) will be set and sealed from the ground surface into the bedrock and grouted in-place. After grout has set, rock coring and/or 4-inch diameter drilling will then continue into the bedrock up to 150 feet.

Expansive hydraulic grout (ASTM C 845-87) will be used. The grout placement technique will be positive displacement through a tremie pipe.

The monitoring wells will be left as open boreholes which is the method used for the few bedrock water wells in the vicinity of the site. The wells will be developed using pumping or air lift, if necessary, since the air rotary technique has a tendency to be self developing.

CORE SAMPLES AND WELL LOGGING

As a minimum, 5-foot rock cores will be taken approximately at the following intervals, as appropriate: -5 to -10 ft., -15 to -20 ft., -60 to -65 ft., -100 to -105 ft., and -145 to -150 ft. where 0 is the top of competent bedrock. A geologist will continuously log the borehole cuttings. Additional rock cores may be taken if the field geologist notes significant changes in lithology. Bedrock will be cored using an NX coring device per the Phase II RI/FS plans and procedures. Borehole geophysics will not be used.

SLUG TESTS

Slug tests (displacement slugs) will be conducted as the rock coring or drilling proceeds to determine if the bedrock has significant yield. Slug tests, with low yields and slow response times, will be discontinued before full recovery to minimize standby time of the drilling equipment. The following conversative criterion (based on 10 gpm or greater yield) will be used to discontinue the slug tests and continue drilling or coring:

$$H/H_o < 0.5 \text{ for } t = 0.5\ r^2\ d$$

where H_o is the initial head calculated from the displacement volume divide by the borehole area (ft.)

t is time (minutes)

r is the borehole radius (ft)

d is depth of boring in the bedrock (ft).

Final quantitative slug tests for hydraulic properties of the completed monitoring wells will be conducted per the Phase II RI/FS plans and procedures.

WELL SAMPLING AND ANALYSIS

All onsite bedrock and lower sand monitoring wells will be sampled and then analyzed for TAL metals, TCL volatiles and TCL semi-volatiles. The sampling and analysis will follow the same quality assurance project plan and procedures as prior Phase II RI/FS activity. The same laboratory (Compuchem) will also be used.

Water levels, field pH, specific conductance, and temperature will be measured in the field on all bedrock and lower sand monitoring wells.

The lower sand wells to be sampled include: D&M-06, D&M-09, D&M-11, DMW-02, DMW-03, DWM-06, DMW-07, and SMW-10. In addition to the two new bedrock wells, the following bedrock wells will be sampled: D&M-05, D&M-07, D&M-08, D&M-10, D&M-12, D&M-13, and BMW-07.

REPORTING AND SCHEDULE

A draft report will be developed as a supplement to the Phase II RI report. The additional activities covered by this workplan will require 24 weeks to execute excluding EPA review and possible revisions of the draft report. The schedule is based on four weeks to select and issue a contract with a qualified well driller; eight weeks for mobilization, well construction, development, and sampling; six weeks for laboratory analysis; and six weeks for quality assurance review, data evaluation, draft report preparation, and internal review. The final supplemental report will be submitted to EPA within 30 days of receipt of EPA comments on the draft report.

In the event that information from this additional study significantly changes the results of the Phase II RI or FS reports in EPA's judgement, then, at least 30 additional days shall be provided to revise each document (i.e., 60 days if both require revision).

Submit draft supplemental report	24 weeks from receipt of EPA approval of this workplan
Submit final supplemental report	30 days from receipt of EPA comments on the draft
Revision Phase I RI and/or FS reports	30 days if one document, 60 days if two documents, from EPA notification based on the final supplemental report

The same Force Majeure provisions for the Phase II RI/FS will be in effect for this activity.

REFERENCES

1. Draft Phase II Remedial/Investigation Maryland Sand, Gravel and Stone Site, Elkton, Maryland, Dames & Moore, February, 1988.

2. Hydrologic Data for Cecil County, Maryland, Basic Data Report No. 16, Maryland Geological Survey, 1987.

3. The Water Resources of Cecil, Kent, and Queen Annes Counties, The Ground Water Resources, Bulletin 21, Board of Natural Resources, 1958.

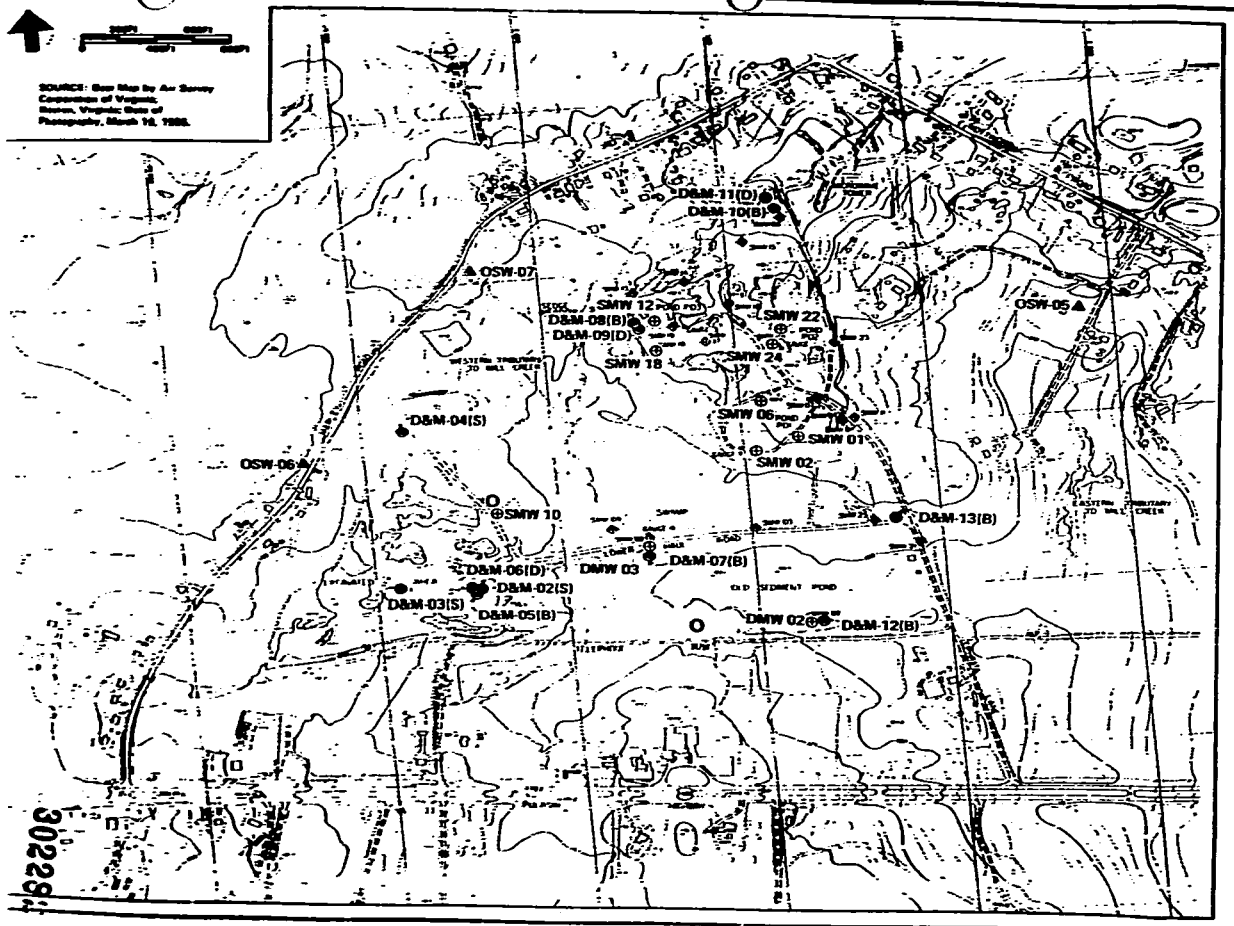


FIGURE 1
LOCATION OF ON-SITE MONITORING WELLS AND RESIDENTIAL WELLS SAMPLED NEAR THE SITE